Docket No. 32,421-C2
PATENT

#1.5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Price, L., Pausch, M.**

Serial No.: **Not yet assigned** Group No.: **Anticipated: 1800**

Filed: **March 11, 1997** Examiner: **Not yet assigned**

For: **POTASSIUM CHANNELS, NUCLEOTIDE SEQUENCES ENCODING THEM, AND METHODS OF USING SAME**

ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97 AND 1.98

This Information Disclosure Statement is submitted in compliance with the Duty of Candor and Good Faith imposed by 37 C.F.R. § 1.56, and in conformance with the regulations set forth at 37 C.F.R. § 1.97 and 1.98. Applicants and their Attorney submit herewith a PTO Form 1449 listing certain patent applications and other publications, along with copies thereof. These documents have been brought to their attention through the U.S. prosecution of the parent application, the International Search Report issued during search phase of the corresponding PCT application, or have otherwise come to their attention, and mentioned in the Background of the Invention for this application. These documents, including those of record during the prosecution of the corresponding applications may be considered by a reasonable U.S.P.T.O. Examiner to be relevant in deciding whether to allow the currently pending U.S. application to issue as a patent.

The filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made [37 C.F.R. 1.97(g)], an admission that the information cited is, or is considered to be, material to patentability or that no other material information exists.

The filing of this Information Disclosure Statement shall not be construed as an admission against interest in any manner [Notice of January 9, 1992, 1135 O.G. 13-25, at 25].

The relevance of each of the documents is set forth as follows:

Documents Cited in the Corresponding PCT Patent Application Search Report:

WO 96/13520

This is the corresponding PCT application, which is a parent application to the current CIP.

Biophys. J. 63, 1406-1411 (1992):

Describes the characterization of potassium channel subunits formed by fusion of two Shaker K channel sequences. Shaker proteins are composed of 6 transmembrane domains (TMDs) and a single pore-forming (P) motif. Thus, fusion of two Shaker subunits forms a monomeric subunit composed of 12 TMDs and two P domains. Such an artificial construct is not found in nature and is topologically distinct from the claimed protein which is composed of four TMDs and 2 P domains.

J. Neuroscience, 13, 4669-4679 (1993):

Describes a possible role for Eag in the modulation of heteromultimeric Drosophila K channels. Eag polypeptides are composed of 6 TMDs and a single P motif, and thus are topologically distinct from the claimed protein which is composed of four TMDs and 2 P domains.

Nature 345, 530-4 (1990)

This report describes the formation of heteromultimeric Shaker channels via coexpression of two different subunit types in Xenopus oocytes. Shaker type proteins differ from the claimed protein in their membrane spanning topology as described.

Nature 368, 32-38 (1994):

Reports a large segment of DNA sequence from the *C. elegans* chromosome III.

Science 256, 663-665 (1992):

Reports the use of a potassium uptake deficient yeast strain to expression clone a plant potassium channel. The channel, AKT1, is composed of 6 TMDs and a single P motif and thus differs from the claimed channels in its membrane spanning topology. The report does not suggest the use of the combination of a heterologous potassium channel and the yeast strain to screen for pesticides or therapeutics.

EPA 615 976:

Describes a cloning of a cDNA encoding a lepidopteran sodium channel. Sodium channels allow passage of sodium ions and exclude potassium ions. This type of channel is composed of 24 TMDs and 4 P motifs, making it topologically distinct from the claimed channels. The DNA and amino acid sequences of the claimed channels are also distinct from the sequences in this report. This patent does not claim use of potassium channels as potential pesticide or therapeutic targets, nor the use of yeast to mobilize screening assays.

PNAS 86, 4372-4376 (1989):

This report suggests a method by which potassium channels may be cloned. The method is based on similarities between voltage-gated potassium channels that share topological features and amino acid homology in the S4 and S5 domains with Shaker. This method is not likely to identify the claimed channels because they lack topological similarity.

U.S. Patent # 5,356,775:

This patent describes cloning of a member of the inward rectifier class of potassium channels. This class is typified by 2 TMDs separated by a single P domain, making them topologically distinct from the claimed channels. The DNA and amino acid sequences of DORK, CORK, and HORK are distinct from the sequences in this report.

Nature 362, 127-133:

This report describes cloning of another member of the inward rectifier class of potassium channels. This class is typified by 2 TMDs separated by a single P domain, making them topologically distinct from the claimed channels. The DNA and amino acid sequences of DORK, HORK and CORK are distinct from the sequences in this report.

Nature 376, 690-695 (1995):

This report describes a novel yeast potassium channel which is presumed to be composed of 8 TMDs and 2 P domains making it topologically distinct from the claimed channels. The DNA and amino acid sequences of DORK, HORK, and CORK are distinct from the sequences in this report.

Documents Considered by the Examiner in the Corresponding U.S. Parent Patent:

U.S. Patent No. 5,559,026, Price et al., issued September 24, 1996: This is the corresponding parent patent.

The following patents and other publications are relevant to the examination of the current patent application as being considered by the U.S. patent examiner in the examination of the parent application that matured into the above-referenced issued patent:

U.S. Patent No. 5,356,775, issued 10/1994 to Hebert et al; U.S. Patent No. 5,492,825 issued February, 1996 to Jan et al.; U.S. Patent No. 5,494,895 issued 2/96 to Garcia et al.; Elledge et al. (1991) Proc. Natl. Acad. Sci. USA 88: 1731-1735; Ketchum et al. (1995) Nature 376 (6542): 690-695; Tang et al. (1995) Mol. Biol. Cell 6: 1231-1240; Xu et al. (1995) J. Biol. Chem 270(42): 24761-24768; and Zhou et al. (1995) FEBS Letters 272: 170-176.

The following documents are relevant as described in the Background of the Invention for this patent application, on pages 3, 4, and 5:

Kubo *et al.,* Nature 364, 802-806 (1993); Kubo *et al.,* Nature 362, 127-133 (1993); Ketchum *et al.*, Nature 376, 690-695 (1995); Lesage *et al.*, J. Biol. Chem 271, 4183-4187 (1996); Goldstein, S. *et al.,* Proc. Natl. Acad. Sci. USA 93 13256-13261 (1996) - "DmORF1; Fink, M. *et al.,* EMBO J. 15, 6854-6862 (1996) - "TREK"; Lesage *et al.*, EMBO Journal, 15, 1004-10111 (1996) - "TWIK-1"; Lesage F. *et al.*, FEBS Lett. 402, 28-32 (1997); and Wei *et al.*, Neuropharmacology 35 805-829 (1996).

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The Examiner is asked to consider the above documents, and indicate such consideration by initialing the enclosed PTO Form 1449 in the appropriate spaces provided on that Form. Since this Information Disclosure Statement is provided within three (3) months of the filing of this Application in the U.S.P.T.O., no fee is required.

Respectfully submitted,

Gale F. Matthews
Reg. No. 32,269